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THE WEEKLY SUMMARY OF CURRENT SCIENCE • DECEMBER 30, 1944

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A SCIENCE SERVICE PUBLICATION

PUBLIC HEALTH

DDT May Control Malaria

Public Health Service tests show it is successful as mosquito control weapon in rural areas of the South. Spraying inside houses effective.

➤ DDT may solve the problem of malaria control in rural areas of the South, it appears from a test conducted by the U. S. Public Health Service in Arkansas. Results of the test, called "striking," were reported by Dr. F. L. Knowles, senior biophysicist of the office of malaria investigation, U. S. Public Health Service, at the meeting of the American Association of Economic Entomologists in New York.

A widespread Federal campaign, to combat the threat of malarial flare-ups resulting from the return of service men who have contracted malaria overseas, is expected to get under way as soon as sufficient DDT becomes available.

DDT supplies "will remain very tight through March and possibly April," John A. R. Rodda, in charge of insecticide allocations in the War Production Board, told the entomologists. "We are still working on military needs, which are consuming practically the entire production. Besides, the raw materials for manufacturing DDT have become critical and are granted only because of the military needs for DDT."

Describing the Arkansas DDT tryout in malaria control, Dr. Knowles pointed out that malaria is an unsolved problem in the southern states because regular control methods are too expensive.

"Spraying the insides of the houses is more effective. The unique residual toxicity of DDT should make it still less expensive and more practical.

"We picked 36 square miles in Arkansas near Helena. This is cotton country. Ninety-five per cent of the houses are of tenant or sharecropper type, shotgun-construction, newspaper-lined, inhabited by Negroes making only a marginal living. With two high school boys we sprayed the insides of these last summer, leaving every 25th house unsprayed as a check.

"Daily inspections of the sprayed houses throughout two months after spraying showed that for that long a period, there was a 94 per cent average reduction in the number of mosquitoes resting, alive, on the indoor walls."

What happened, he said, was that the mosquitoes came indoors at night, alighted on walls and ceilings bearing an invisible residue of DDT, and were fatally poisoned. This effect takes several hours, but is rapid enough so that "there was an average 80 per cent reduction in number of living, resting mosquitoes from early morning to afternoon."

This technique, it was added, hits the mosquitoes at the strategic time: the night, when they are lying in wait indoors to bite sleeping victims.

The job used an average of .82 of a gallon per house of five per cent DDT solution. Per house it consumed 10 minutes, took .73 of a man-hour, and cost 74 cents for material and labor.

Science News Letter, December 30, 1944

ORDNANCE

Three Military Inventions Recently Patented

➤ INVENTORS of warlike devices have been active, as is evidenced by several patents. Two are by civilian employees of the Army's great arsenal at Springfield, Mass. The first, by Vail W. Grant, is on a rear sight for rifles that is essentially a U-shaped spring, lying flat on the weapon, with the sight aperture at the end of the free arm. A rotatable block under this provides means for elevation, and the spring action keeps the sight snugly in correct position. This patent is numbered 2,364,067.

The second patent is numbered 2,364,103, and is on an improved spring-hydraulic recoil mechanism for firearms, the invention of C. E. Simpson. He states that it will make possible the shoulder-firing of weapons of .60 caliber and larger. A backward-projecting rod attached to the mechanism also provides means for making the breech mechanism automatic or semi-automatic in operation.

Another invention in the military field is by an Army officer, Maj. Robert Van Roo; it is covered by patent 2,364,113. Maj. Van Roo's invention is a machine for stacking the large, cylindrical "grains" of cannon powder (which are often as big as a man's thumb) in straight, even rows, insuring more uniform burning and hence better ballistic performance by the guns in which the charges are used.

Rights in all three of these patents are of course assigned royalty-free to the government.

Science New Letter, December 30, 1944

JETS EXPOSED—The 18 jets through which the propellant mixture in the V-2 rocket is sprayed into the combustion chamber are shown here. These RAF pictures (see also cover and facing page) were made of a rocket which fell in Belgium.

JAN 10 1945

ORDNANCE

Chemicals Used in V-2

Hydrogen peroxide and potassium permanganate prevent the Nazis' new rocket from blowing up in their faces and give it brisance.

RADIATION LABORATORIES RESEARCH LABORATORIES LIBRARY

See Front Cover

➤ TWO CHEMICALS, hydrogen peroxide and potassium permanganate, prevent the Nazis' V-2 rocket from blowing up in the launchers' faces and also give it brisance, or extra power and speed. The 15-ton, 46-foot-long rocket is thrust through the air by a highly explosive propellant mixture of alcohol and liquid air. This propellant causes the V-2 to travel faster than sound to altitudes estimated at 60 miles above the earth.

The reaction of liquid air on alcohol produces a highly explosive mixture which ordnance experts call "unstable." Hydrogen peroxide and permanganate are both oxidizers and their use insures the maintenance of uniform combustion, and prevents danger from "flashing" or an explosion of the mixture inside the rocket which might ignite the entire rocket and cause it to be blown to bits. Scientists state that such use of hydrogen peroxide and permanganate makes them catalysts. That is, they are substances which, while apparently taking no part in the combustion of the liquid air and oxygen, nevertheless, by their mere presence control the speed of the combustion.

A sectional drawing of the V-2 released by official British sources shows that it contains in its body two large tanks, the forward tank holding alcohol and the rear tank holding liquid oxygen. Pipes from these tanks run into a turbine and pump assembly. Also leading into this assembly are pipes from the hydrogen peroxide tank and the permanganate tank. In the turbine, the four components of the combustible mixture are blended and by pressure from bottled air and bottled nitrogen they are released as a fine mixed spray through 18 jets which make up the forward end of the combustion chamber. Here, thanks to hydrogen peroxide and permanganate, the explosion is localized and the rapidly expanding hot gases are expelled through the jets at the rear, forcing the rocket upward.

Alcohol is capable of burning with liquid air, and therefore no oxygen from the outside is needed to insure combustion. This makes it possible for the jet mechanism to operate at stratospheric heights where there is very little air, and where it is possible to get more power from less fuel. Alcohol is also used as a coolant in the V-2 to keep the jet from getting so hot that it would melt.

Peacetime uses of hydrogen peroxide include applications as a bleaching agent in the textile, felt hat and other industries; as a bleach for hair, making a dark brunette into a platinum blonde; and as a disinfectant. Potassium permanganate, a compound of manganese, the metal used to make tough steel for burglar-proof safes, is also an exceilent disinfectant and bleaching agent.

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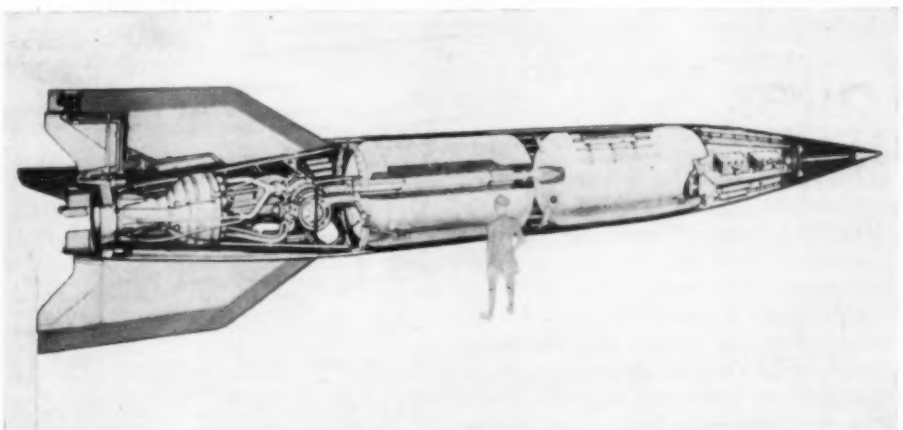

***INSIDE THE V-2**—This cutaway drawing of the V-2 shows the location of the alcohol and liquid oxygen tanks (two large tanks in body) to the left of which, at the bottom, is the small hydrogen peroxide tank. Above the small tank you see the turbine mixing pump. At the left of the mixing pump is another small tank, the container for the permanganate. Pipes from the pump run to the combustion chamber, the unit that looks like an hourglass, where the liquids are exploded and the hot expanding gases released through the venturi jet. Note comparative size of the rocket and the man standing beside it.*

LANGUAGE

Dictionary for Aleuts Will Be Available Soon

➤ A DICTIONARY for the Aleuts of the Aleutian islands and Alaska mainland, to be published soon by the U. S. Office of Indian Affairs, will be of assistance to these 6,000 American citizens in translating their strange language into English. At the same time it provides them with a new alphabet of 18 characters, the same kind of characters used in English, but often with different pronunciations.

The language of the Aleuts is difficult. It is one of the Eskimoid dialects, but due to isolation for centuries on these distant islands it is so different as to be almost entirely another language. Scholars familiar with other Eskimo dialects are unable to translate Aleut. Some of the Aleuts are able to talk Russian, which was the official language during the days of Russian control of Alaska, and some can now talk English.

The new dictionary is the work of two men, Ivan Veniaminov, a Russian missionary who later became Innokenti, Metropolitan Archbishop of Moscow, and Richard E. Geoghegan, an Irish scholar and a leading philologist, who for nine years was a linguistic consultant for the Japanese government and later the British vice-consul in Seattle and Tacoma. In 1902 he went to Alaska as an officer of the U. S. District court and remained there until his death in 1943. The final editing of the work was done by Miss Fredericka Martin, an associate of Mr. Geoghegan.

Veniaminov published in 1834 a *Dictionary of the Aleut-Fox Language* and gave the Aleuts an alphabet in Cyrillic characters, and a grammar. It is this dictionary that is now for the first time translated into English.

Science News Letter, December 30, 1944

NUTRITION

Carotene Needed

Yellow pigment present in carrots and other yellow vegetables and in green leaves of all kinds is found necessary for reproduction in cattle.

➤ CAROTENE, the yellow pigment in such vegetables as carrots and rutabagas, present also in green leaves of all kinds, has been found essential to reproduction in dairy cattle, in researches conducted at a number of state experiment stations, as well as at the U. S. Department of Agriculture's great experimental farm at Beltsville, Md.

When carotene is lacking in the ration during the reproductive cycle, dead, paralyzed, and weak calves result. Cause of the paralysis in the calves is a degeneration of the nerve tracts of the spinal cord. Some cattle go blind when deprived of sufficient carotene.

The vitamin A content of milk is considerably lowered during the winter feeding season as compared to milk produced on pasture, due largely to lack of carotene in hay and dried fodder. Carotene is needed for the formation of vitamin A. Whether or not dairymen will be asked to increase the vitamin A content of the winter-produced milk in market milk areas after the war remains to be seen. The American Medical Association has expressed interest in the subject. It seems doubtful that such increase can be accomplished by using field-cured hay. The use of grass silage offers some possibilities in this direction.

Amount of carotene necessary to bring vitamin A potency of winter milk up to that of summer milk is about 600,000 to 700,000 international units of carotene per day. In order to produce the same effect with vitamin A per se, an intake of 250-300 international units is required, results at the Purdue Agricultural Experiment Station indicate. The cow is not a very efficient user of either carotene or vitamin A, since only from 1% to 3% of the vitamin A or carotene fed actually appears in the milk.

Commercial products containing vitamin A have recently appeared on the market which are supposed to increase milk production. The first one developed was tried extensively at the Walker-Gordon farm in New Jersey with apparently good results. Increases of four pounds of milk per cow per day were reported. Preliminary data on this product have been obtained at University of Maryland.

Science News Letter, December 30, 1944

PUBLIC HEALTH

Soldiers Are Taller

➤ TODAY the average American drafted man is about two-thirds of an inch taller than during the last war, and the proportion of six-footers has increased, according to a report by the Metropolitan Life Insurance Company.

The average height of men in the twenties examined at induction stations for the armed service in May, 1943, was 68.15 inches, when measured without shoes. The first million draftees of ages 21 to 30 examined at mobilization camps in 1917, averaged only 67.49 inches in height.

The proportion of tall men among the 1943 selectees was greater than among those of the last war. Over a quarter (27.5%) of the recent selectees were found to be over five feet ten inches, only 22.4% were so tall in the last war.

At present about nine men in every hundred are six-footers. A quarter of a century ago only six or seven in every hundred reached that height, the company statisticians reported.

This trend toward increased height among American men is also shown by a study of men within certain age groups examined for induction, since the older men were obviously born at an earlier period. The average stature of 18- and 19-year-olds, who have not reached their full growth, is actually a little greater than that of men over 30. Men 20 to 24 years of age are about 68.15 inches tall, whereas those over 35 average 67.54 inches in height.

About 91 in every thousand men between the ages of 20 to 24 were found to be six-footers; less than 58 in every thousand of those 35 or over were this tall.

The figures cited by the statisticians of the Metropolitan Life Insurance Company for 1943 were based upon an analysis of data secured from the Office of the Surgeon General of the Army. Adjustment was allowed for the omission of men inducted into the Navy, for which figures are not available.

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Zinc ore containing certain quantities of *silver* has been discovered near Ravlidmyr, Sweden, at a depth of about 200 feet.

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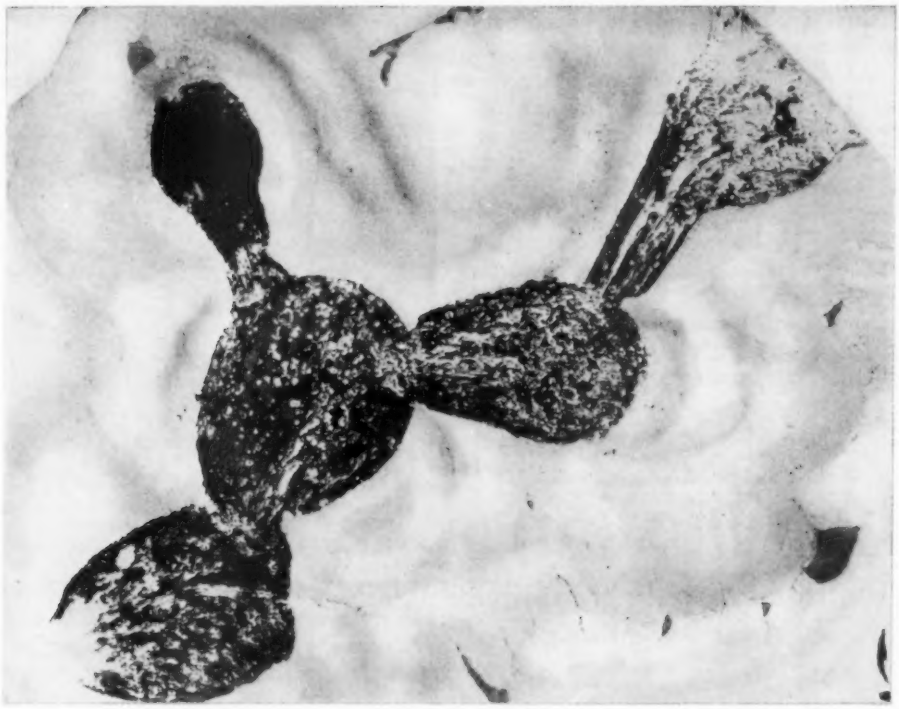

DAWN CACTUS—This fossil imprint in Eocene rocks of eastern Utah, 50,000,000 or more years old, shows that prickly-pear cactus grew in the region then, as it grows there today. Less spiny than its modern successor, it is still very definitely a cactus. The flat-ended structure at upper right is a crushed flower.

PALEOBOTANY

Dawn Cactus Found

Fossil imprints in Eocene shale of eastern Utah show ancestor of the prickly pear cactus. Attached are remains of a flower.

➤ CACTUS grew on Utah hillsides 50 or 60 million years ago, and it was very much like the cactus that grows there today.

First information on this new chapter on ancient American plant life was imprinted on a split slab of Eocene shale found in the Green river valley in eastern Utah by Earl Douglas, veteran collector of fossils. First description of the species is given by Prof. Ralph W. Chaney of the University of California, in a detailed report to the *American Journal of Botany*.

The type specimen of this oldest of all known cacti consists of the fossil traces of three flattened, more or less oval stem joints, unmistakably similar to those of the present-day prickly-pear cactus. Attached to the uppermost joint are the crushed remains of a flower; although poorly preserved, the petals still show the kind of venation they had in life.

From the second joint arises another crushed structure that may have been either a bud or an immature fruit—it is now hard to tell which. In addition to this largest and most complete specimen, there are also fossils of three separate stem-joints of the same species.

Although the ancient plant was unmistakably a cactus of the prickly-pear group, it has characters that indicate its position nearer the primitive base of the cactus family tree. Thus, it is not as thickly beset with spines as most present-day prickly-pears, and the spines it has are relatively short and weak.

Other plant fossils found closely associated with the cactus remains indicate a climate in the region, at the time it grew there, somewhat like that of the Louisiana coast, or of parts of Mexico on the opposite side of the Gulf of Mexico. The fossil leaves and twigs include such species as willow, chestnut, oak, sweetgum, mimosa and bittersweet.

Prof. Chaney has given the ancient plant the botanical name *Eopuntia douglassii*. The first or generic name means "dawn cactus"; the second or specific name is bestowed in honor of the original collector.

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MEDICINE

American Apparatus To Process Soviet Blood

➤ SOVIET blood will soon be prepared for fighting shock in Russian wounded through use of four complete plasma processing units given to the Union of U. S. S. R. Red Cross and Red Crescent Societies by the American counterpart of this organization, the American Red Cross.

Prof. Peter G. Strelkov of the U.S.S.R. Academy of Sciences flew to the United States to arrange for its use in Russia and Capt. John Reichel, Jr., of the Office of the Surgeon General of the U. S. Army, will accompany the apparatus to Russia to aid in its installation and use.

Prof. Vladimir Lebedenko, Washington representative of the Soviet Red Cross, in receiving the apparatus in presentation ceremonies stated that the 4,000 pints of blood daily that will be processed by the four units will supply the Russian armies and civilians in reoccupied areas as well. The equipment was paid for from war relief funds given the Red Cross by Congress.

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ENGINEERING

Rayon and Nylon Tire Cord Much Stronger Than Cotton

➤ RAYON CORD in synthetic tires for trucks, used instead of cotton, has more than tripled the performance of the tires, and nylon cord in airplane tires has doubled their strength without increasing their size. These are two of the many results of scientific research by rubber chemists pointed out at a recent meeting of the American Society of Mechanical Engineers by Dr. Sidney M. Cadwell of the U. S. Rubber Company, who predicted a continued use of synthetic rubber in postwar days.

Rubber chemists, he said, have achieved as much knowledge of synthetic rubber

in three years as had been acquired in 30 years with the natural product. A multiplicity of new materials, combined with new and better types of synthetic rubber make improved tires a virtual certainty of the future.

Butyl, one of the types of newer synthetic rubbers, is proving itself superior to natural rubber for use in inner tubes, Dr. Cadwell stated. One reason is that it has excellent resistance to high temperature; another is that it has superior tear resistance. Its most spectacular advantage, he declared, is the fact that it will hold air three times as well as natural rubber, making it unnecessary to inflate the tires as frequently.

As for the immediate postwar tire, this will doubtless consist of a synthetic rubber casing with a synthetic tread, he predicted. Present day synthetic tires made of GR-S (government rubber, styrene) give tread wear nearly as good as that of natural rubber, he said. They are not as safe against blowouts at excessively high speeds, but they are now reasonably safe and will be improved substantially. Later, he added, synthetic and natural rubber will probably be used together.

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SPECIAL GAS MASK—The U. S. soldier shown in this Signal Corps photograph, wears the gas mask especially designed for hospital patients with head wounds.

MEDICINE

Functional Rehabilitation

Seen as this war's great contribution to the treatment of broken bones. The last war established the principle of skeletal traction.

➤THE GREAT contribution of this war to the treatment of broken bones will be functional rehabilitation, Dr. Edward Harlan Wilson, of Ohio State University Medical School, predicted at the meeting of the American Congress of Physical Therapy in Cleveland.

The last war, he pointed out, established the principle of skeletal traction as a permanent treatment for fractures of the shafts of the long bones. The traction splints developed for this purpose became familiar to many who took first aid courses at the beginning of the present war.

When the present war began, methods of efficient treatment of shock and infection as well as of the broken bone were ready for use, Dr. Wilson continued. As a result, lives have been saved and wounds healed quickly. The consequence has been the fixation of interest on rehabilitation.

In this physiotherapy has a very important place, Dr. Wilson declared.

"It is largely a psycho-therapeutic method," he said, "in that the patient is educated to begin the use of his own muscles in the region of a fracture and is taught how to do it without pain or injury to himself."

When he has definitely learned to move his limb and place weight on it, however, physiotherapy has accomplished all it can. If prolonged further, it will retard the patient's progress because his condition is a mixture of local weakness and stiffness plus general weakness from the prolonged period of rest. British experience and that of our own Army have shown the importance of extremely active physical exercise at this stage of recovery.

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Physical Medicine

➤NEWSPAPER and magazine articles about physical medicine, pictures of whirlpool baths, of technicians giving massage and of other treatment procedures have created a popular demand for this kind of treatment, Dr. Miland E. Knapp, of the University of Minnesota Medical School, told members of the Congress of Physical Therapy on his induction as president of the organization.

Very few doctors, however, have had enough training in physical medicine to be able to prescribe the treatment their patients may need, Dr. Knapp said. Although the Baruch report states that the preeminent need is for more teachers of physical medicine, it will be impossible to correct the situation by employing more teachers, Dr. Knapp said, because there are not enough of them.

"The most feasible solution at the present time," he said, "is to interest one or more members of each clinical department in the phases of physical medicine pertaining to his specialty, prevail upon him to study the possibilities and practice them until he becomes sufficiently familiar with them to assist in the teaching of the subject to others."

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CHEMISTRY

Galacturonic Acid Prepared from Beet Pulp

➤ VITAMIN C can be obtained by a new process developed at the National Bureau of Standards by Horace S. Isbell and Harriet L. Frush, who have found that an important source of the vitamin, galacturonic acid in the form of a salt, can be separated from solutions containing substantial amounts of impurities. Thus, a source of the acid is made available for the synthesis of the vitamin.

In the process, beet pulp was hydrolyzed by a commercial pectic enzyme, after which the resulting galacturonic acid was separated from the residue in the form of a salt.

The Bureau of Standards scientists find that the double salt, sodium strontium galacturonate, crystallizes from the hydrolyzates of beet pulp in the highest yield, but two other salts are of value in separating galacturonic acid from the hydrolyzates of pectic substances.

The commercial use of beet pulp for the preparation of galacturonic acid presupposes a cheap source of pectic enzyme. Since these are produced in the growth of numerous molds, and occur in the culture media, they might be obtained economically as by-products in certain industries. Possible sources, the Bureau states, are the aqueous solution remaining after the separation of penicillin, or the culture media of food molds.

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ASTRONOMY

Three Planets On View

Jupiter joins Venus and Saturn on January evenings; brightest of all is Venus, which remains visible until about 9:00 o'clock.

By JAMES STOKLEY

➤ WITH THE OPENING of a new year, three planets are on view in the evening sky. Brightest of all is Venus, which remains visible until about 9:00 o'clock or later. Its great brilliance (nearly minus four on the astronomer's scale) makes it exceed many-fold any other star or planet that is in the sky, so as you look toward the west as twilight fades, there is little doubt as to where Venus is. However, it does not remain in the sky long enough to find a place on the accompanying maps, as they depict the appearance of the heavens at 11:00 p. m., war time, on Jan. 1, and an hour earlier at the middle of the month.

One planet is shown on them, however. This is Saturn, which is in the constellation of Gemini, the twins, high in the south. It is in the middle of the most brilliant collection of stars in the heavens, but, with magnitude minus 0.2, it easily holds its own, for of this group only Sirius, in Canis Major, the great dog, exceeds it. Nearly as bright is Capella, in Auriga, the charioteer, which stands almost overhead. Rigel, the bright star in Orion to the south of the three stars that mark the warrior's belt, is just a tenth of a magnitude fainter than Capella, though the fact that it is lower in the sky, and therefore more of its light is absorbed as it passes through our atmosphere, makes it seem still fainter.

Next in order of brightness, and a little fainter than Rigel, is Procyon, in Canis Minor, the lesser dog. Then comes Betelgeuse, the reddish star in Orion to the north of the belt, though this is a variable, and may become about as bright as Capella. On the other hand, it may drop to the brightness of Aldebaran, the red star in Taurus, the bull, which is to the right of Saturn, and is the next in our ranking by magnitude. Pollux, high in the east, the lower and brighter of the two stars that mark the twins, Gemini, then comes in last place of this brilliant array of first magnitude stars in and around the figure of Orion.

Two other stars that are classed among the first magnitude are also shown, but both are too low to make them appear in full brilliance. One is Regulus, in Leo, to the east, and the other is Deneb, about all that remains in sight of Cygnus, the swan, near the northwestern horizon.

The third planet of our January evening sky appears about 11:00 p. m. This is Jupiter. It is in the direction of the constellation of Virgo, the virgin, which is not shown on the maps, but is next-door to Leo, which is shown. Jupiter, with magnitude minus 1.8 is a little brighter than Sirius, though still considerably fainter than Venus. But since Venus has vanished before Jupiter appears, it will then be the brightest star or planet that is visible.

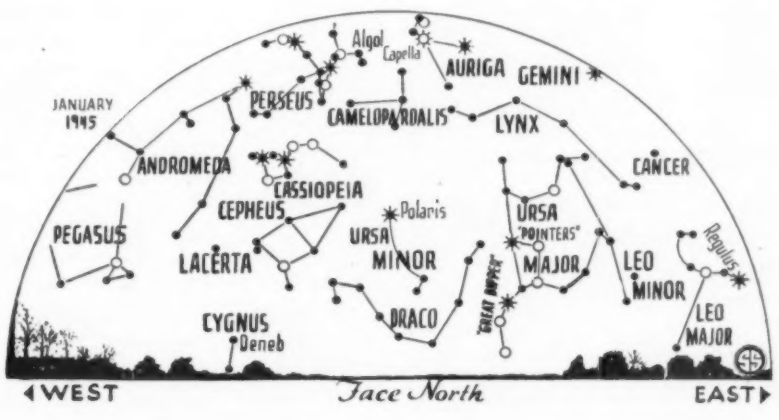
As for the other naked eye planets, Mercury may be glimpsed briefly in the east, a short time before sunrise, around Jan. 12, for then it reaches greatest western elongation, when it rises about an hour before the sun. Mars is in Sagittarius, the archer, in nearly the same direction as the sun, so it is not visible at all in January.

It is impossible for a year to pass without at least two eclipses of the sun. The new year brings us the minimum number, but while one of them will probably have a number of observers, the first, which happens on Jan. 14, will attract relatively little scientific interest.

An eclipse of the sun occurs when the moon's shadow is directed toward the earth. This shadow, however, is quite different from the one cast by your body when you enter a dark room carrying a candle. You are a great deal bigger than the source of light—the candle flame—and so the lines forming the shadow diverge. The shadow cast on a wall, therefore, may be greatly magnified. Because the sun is many times larger than the moon, its shadow comes to a point, at a distance approximately equal to that of the earth. Sometimes, when earth, moon and sun are exactly in line, the tip of the lunar shadow does reach us, and then we have a total eclipse, while on other occasions the tip fails to reach the ground.

This is what happens Jan. 14. Then, to a person in the path along the earth to which the tip of the shadow points, the moon will come in front of the sun but will not entirely cover it. Because the moon's apparent size will then be a little less than the sun's, there will be visible a ring of sunshine around the dark lunar disk when the eclipse is at its height. That is why it is called an "annular" eclipse, since "annulus" is the Latin word for "ring." Because part of the sun's disk continues to shine the faint solar corona and other features for which astronomers travel thousands of miles to see at a total eclipse are not visible.

For the eclipse on the 14th, the path along which the annulus will be visible starts on the Indian Ocean coast of South Africa, travels eastward until it passes over the Bass Strait, which separates the southern tip of Australia from the island of Tasmania. The path then goes north of New Zealand, and comes to an end in the South Pacific Ocean. There is very little land in this path, but over a much larger region, including much of the Indian Ocean, Antarctica, New Zealand and Australia, there will be a partial eclipse, where the moon will hide part of the sun. This will be seen in part of New Guinea as well, and many of our soldiers in the South Pacific theater will



Do You Know?

A *sulfate plant* is in operation at Osijek, Yugoslavia, to produce fertilizer, and also copper sulfate needed by grape growers.

Eggs from two to four weeks old make more tender angel food and sponge cakes than do fresh eggs, the University of California claims; but spoiled eggs must not be used.

Mexican regulations require that *cars* be kept idle one day a week to conserve tires; a windshield sticker on each car shows the day it is not to be used.

The total capacity of *chick hatcheries* in the United States increased 27% in the past six years, but the total chick output increased 105%.

Two rare *metallic elements,* germanium and gallium, have been found in flue dusts from certain chemical works in England in quantities large enough to be a possible commercial source.

A *pigmy forest* near Fort Bragg, Calif., covering over 30 square miles of pine barrens with an acid soil, contains mature trees many of which are not over a foot high; they are cypress, and pine with miniature cones.

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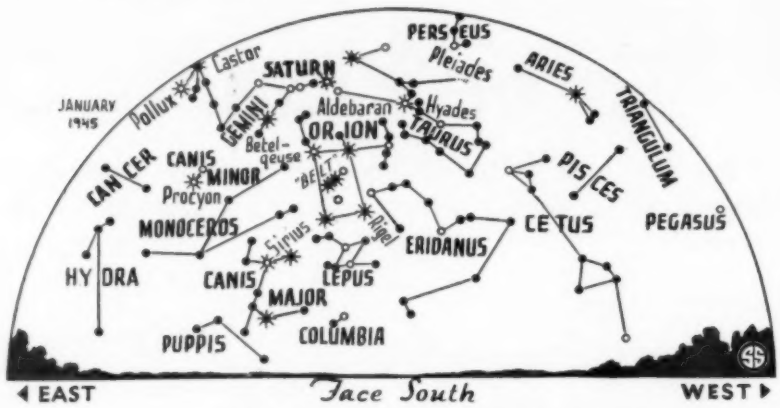


✲ ✷ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

get a glimpse of this annular eclipse.

The second eclipse of the sun comes on July 9. This one is total, and is much more conveniently placed. In fact, it will be visible partly in the United States, the first we have experienced since August, 1932, when the path of a total eclipse crossed New England. The tip of the shadow in July will fully reach the ground, first at a point just east of Boise, Idaho, just as the sun is rising there. Then it crosses Butte, Mont., where the total phase will occur quite early in the morning. It travels northeastward, across Canada, to the shore of Hudson Bay, where the total phase will last about 47 seconds. Here the sun will be fairly high, and it might be a good place for observers from the United States and Canada to go and see it. The path then goes to Greenland, where totality occurs about 11:00 a. m., and lasts about a minute and 14 seconds. This region, which used to be one of the most inaccessible in the world, is now reached daily by planes of the Air Transport Command, so it may be a place for many observers. From Greenland, the path goes to Norway, Sweden, Finland and Russia. The shadow leaves the earth east of the Sea of Aral, in Siberia, just as the sun is setting there. Russian astronomers have been very active in recent years, despite the distractions of war, and they will probably be located at a number of stations along its path within their borders, even though the longest duration they will have for the total eclipse will be only slightly over a minute. Over practically all of North America and Europe, as well as parts of Asia and Africa, there will be seen a partial eclipse.

The new year also brings two eclipses of the moon. The first, a partial one, comes on June 25, and will be visible over a region generally similar to that of the partial solar eclipse in January. But the second, on the night of Dec. 18, will be total and that will be visible throughout the United States and Canada, as well as the rest of North America and South America, so it will undoubtedly attract a lot of attention.

Celestial Time Table for January

Jan.	EWT	
1	7:00 p. m.	Earth nearest sun, distance 91,314,000 miles.
4	4:21 p. m.	Moon passes Jupiter.
5	4:00 p. m.	Moon farthest, distance 251,320 miles.
6	1:47 p. m.	Moon in last quarter.
12	4:12 a. m.	Moon passes Mercury.
	11:00 p. m.	Mercury farthest west of sun.
14	1:06 a. m.	New moon — annular eclipse of sun.
17	10:02 a. m.	Moon passes Venus.
	1:00 p. m.	Moon nearest, distance 228,200 miles.
20	7:48 p. m.	Moon in first quarter.
25	1:34 p. m.	Moon passes Saturn.
28	2:41 a. m.	Full moon.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, December 30, 1944

MEDICINE

Gallbladder Colic Pain Relieved by Asthma Drug

➤ THE EXCRUCIATING pain of an attack of gallbladder colic can be quickly relieved by a medicine already known for the relief it gives in angina pectoris and bronchial asthma, Dr. Arthur Gladstone and Dr. Louis Goodman, of the University of Vermont College of Medicine, report. (*Journal, American Medical Association,* Dec. 23).

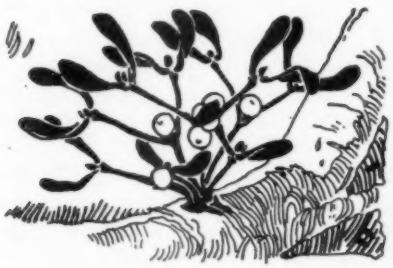
The medicine is called theophylline ethylenediamine or aminophylline. It is given by slow injection into the patient's vein and has relieved patients on whom morphine had no effect. The Vermont doctors believe that its pain-relieving effect is due to its relaxing or antispasmodic action on the muscles of the biliary tract and perhaps on the gallbladder itself. It is not a cure for gallbladder disease but the Vermont scientists believe its pain-relieving potentialities in gallbladder colic have been overlooked.

Science News Letter, December 30, 1944

BOTANY

NATURE RAMBLINGS

by Frank Thone



Mistletoe Is Different

➤ CONSERVATIONISTS are often much concerned—and with reason—over large-scale use of Christmas greens and garlands. Native holly, ground pine and several other plants largely used in holiday decorations are dwindling species in many regions; their continued exploitation strips our woodlands most destructively.

Mistletoe, however, falls into a wholly different category. Entirely aside from its romantic connotations, its use is approved without reservation. For mistletoe is itself a menace to the woods; it is a harmful parasite on some of our best tree species, and conservationists would not mind at all if it were reduced nearly to the vanishing point.

It surprises some persons to learn that mistletoe is a parasite, for we have become accustomed to thinking of plant parasites in terms of the cadaverous pallor of fungi, dodder and such-like leafless growths, whereas mistletoe has plenty of glossy green leaves.

There is, however, a kind of hemiparasitism, known to botanists as water- or sap-parasitism; and this is the habit of the mistletoe. It sends its root-like feeding organs (haustoria, if you want to be technical) into the sap-carrying regions of the wood and helps itself to the water that the tree has gone to all the trouble to raise many feet from the soil beneath. Along with the water, of course, it takes the dissolved mineral salts. But having chlorophyll in its leaves it is able to complete the manufacture of food substances out of these stolen materials, plus carbon dioxide from the air.

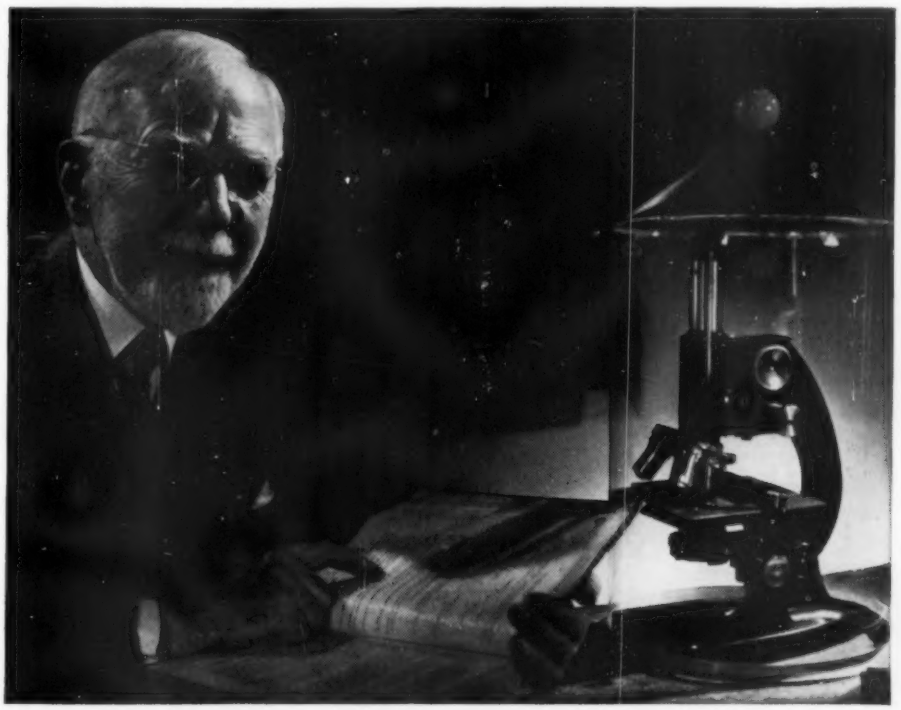
It might seem that this levy upon the host tree for part of its rising sap stream should not do too much harm. However, the fact is that a limb supporting a big clump of mistletoe usually shows a decided change in diameter above the point of infestation. It may be, of course, that the mistletoe excretes some poisonous substance into the tissues of its host, in addition to robbing it of sap, but that is only a conjecture.

In the South, where practically all native American mistletoe grows, market gatherers have a crude but effective method of harvesting it off the limbs of tall trees. They simply fire charges of buckshot into the clumps, and gather up only the better specimens from the resulting shower of broken pieces.

Science News Letter, December 30, 1944

Ivy poisoning runs its course in from one to three weeks.

No satisfactory substitute has been found for the *Japanese agar*, an important bacteriological medium, or germ-cultivation substance; production from American seaweed is far short of the 600,000 pounds needed annually.



A Tribute to America's Teachers

America's greatest victories are won in her classrooms. Not alone are they the victories against ignorance and illiteracy . . . but the great victories as well, in scientific and industrial accomplishment . . . and the victories that emblazon our battle record.

In this there is the finest tribute that America could give her teachers. For in the hearts and minds of those who leave the classroom there has been instilled something above knowledge . . . a molding of the character . . . a shaping of the will . . . the unselfish gifts of those who have taught them.

No greater force ever existed for the shaping of the destiny of a nation than that in the hands of America's teachers. And no greater force has ever been better used. We have seen it evidenced in the courage of Corregidor . . . in the vast, whirling intricacy of the world's mightiest industrial machine . . . in the new wonders of science that light up the horizons of the future . . . and we see it in the smiling, proudly lifted faces of our children.

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MEDICINE

Group Practice Favored

Young doctors now in the armed services desire group practice of medicine, recent American Medical Association poll is said to reveal.

➤ SIGNS that the young doctors now in the armed services favor group practice of medicine are seen by Dr. Kingsley Roberts, director of Medical Administration Service, Inc., in a recent American Medical Association poll.

The A.M.A. poll consisted of a questionnaire mailed to 3,000 medical officers on duty with the armed forces. The officers were selected by pulling every fifteenth name from an alphabetical record list of all medical officers on duty with the Army, Navy, Public Health Service and Veterans Administration as of Sept. 30, 1943. Results of the first 927 returns received by June 1 of this year were reported by Lt. Col. Harold C. Lueth, liaison officer with the American Medical Association.

Besides questions on general information, the questionnaire covered medical education, industrial medicine, licensure and practice, and economic considerations, according to the report in the *Journal*.

"A majority of all physicians answer 'Yes' to the question of whether or not they would like to become 'associated in private practice' with an organized group of physicians," states Dr. Roberts in his own report on the poll which appears in *Medical Care*, a journal concerned with present and postwar problems in medical-social economics.

"The figure is 54% among the youngest men and 57% in the 25-42 age group. This," Dr. Roberts declares, "makes it clear that many of our doctors in uniform recognize, through practical demonstration, the trends within medicine which make solo practice no longer either the best or the most economical kind of service for the physician or for the patient.

"The returns show that our doctors, young and old, don't want, after the war, 'to pick up where they left off' before it," Dr. Roberts continues, referring to a statement by "one elderly editor of a medical journal" not otherwise identified. "It is clear that a great many of them want something different."

On this point the returns as published in the *Journal* give the numbers wanting general practice, specialty practice, practice with a group of physicians, teaching, and so on, but do not show specifically whether the choices represent a change from the type of practice the doctors were engaged in before the war. Many of the younger men, the A.M.A. report points out in another connection, went directly into the armed forces from hospital service. In other words, they had not yet started any kind of practice. The returns do show, as Dr. Roberts points out, that many of the younger men want more education after the war.

"The returns do not mean," Dr. Roberts states, "that solo practice is going out by 1950 or that government practice is sweeping in. However, they do mean that the official leaders of medicine must now utilize a more realistic guide as to where they should lead."

It is the over-50 group of doctors which now runs medical societies and tries to shape medical opinion, Dr. Roberts contends. He questions whether "these elderly minds" will try to give the under-40 physicians what the younger men and many forward-looking older men want for the future. The fact that a poll of the younger men is being conducted might, of course, be given by the A.M.A. as its answer to this question.

"If fuller returns from this and subsequent questionnaires bear out the first 927 replies," Dr. Roberts points out, "the lay public as well as the doctors will have a foot rule with which to judge the responsiveness and the competence of these official leaders of the profession."

Science News Letter, December 30, 1944

Radio reception varies with the phases of the moon, according to a Massachusetts Institute of Technology authority; it improves from the time of the moon's first quarter to shortly before full moon, and again from about the moon's last quarter until a few days before the new moon.

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• Books of the Week •

➤ ELECTRICITY, called the SOUL OF AMBER by Albert Still (*Murray Hill,* $2.50), has had an exciting, dramatic, and sometimes amusing history. In this brief book the author allows the reader to follow any one or more of three paths, first the progress of discovery in the science that led to electronics; second, the lives and personalities of such men as Gilbert, Volta, Franklin, Ampere, and others who contributed to its progress; and finally, the account of how the discoveries were made. It combines man, history, and science into a pleasing leisure-hour book.

Science News Letter, December 30, 1944

➤ A GEOGRAPHER, Roderick Peattie, presents in brief, easily digestible, vividly phrased form the salient facts about the influence of geography on war and peace. Very definitely, however, LOOK TO THE FRONTIERS (*Harper,* $3.) is *not* another paraphrase of the now well-worn geopolitical thesis; the author will have none of the gospel according to Mackinder and Haushofer. A great merit of the book is its brevity: everybody should read it, and it is compact enough so that everybody can read it.

Science News Letter, December 30, 1944

➤ WHAT SHIP IS THAT? is a question of acute interest anywhere at sea, nowadays. The blocky little volume of that title, edited by a British veteran of the sea, contains thousands of sharply-drawn little silhouettes that will help to find answers quickly. (*Didier,* $4.)

Science News Letter, December 30, 1944

➤ HOW FIGHTING MEN of the sea, with at first little but a fierce love of freedom and an unbroken will to resist, found means to strike again at the enemy is told by A. D. Divine, in NAVIES IN EXILE (*Dutton,* $2.75). It is the story of the return to the line of battle of the defeated, but unbeaten, sailors of Poland, France, Norway, Greece and the other overrun countries of Europe.

Science News Letter, December 30, 1944

➤ PROUDEST SHIPS that ever trod down the waves, the Yankee Clippers, have their tale well told by Alexander Laing, in CLIPPER SHIP MEN (*Duell, Sloan and Pearce,* $3.). Back of the ships were their designers, men in whose hands marine architecture was both an art and a science. Men and ships alike are but a memory now (albeit a glowing one), nevertheless the influence of clipper design crops out, like an ineradicable living blood strain, in many a swift hull of today's commerce and war.

Science News Letter, December 30, 1944

➤ AN ENEMY dug in is an enemy difficult to destroy—as no one needs to be reminded nowadays. Better and more detailed knowledge of the most numerous dug-in enemies of plants is offered in a new book, ROOT DISEASE FUNGI, by S. D. Garrett, noted Australian mycologist. This should aid materially in more successful combat. (*Chronica Botanica,* $4.50.)

Science News Letter, December 30, 1944

➤ THE NAVAHO DOOR (*Harvard Univ. Press,* $4.) is the narrative of a medical couple, Alexander and Dorothea Leighton, who tried to understand their patients as well as to minister to their physical needs. The result is a most interesting book, in which the impact of the white man's culture on a group of Indians long considered "difficult" is shown from an entirely fresh angle.

Science News Letter, December 30, 1944

➤ PLIOCENE FLORAS OF CALIFORNIA AND OREGON, edited by Ralph W. Chaney, is a book by and for professionals; but its special audience will have a most eager welcome for it. (*Carnegie Inst. of Washington,* $4.50.)

Science New Letter, December 30, 1944

• Just Off the Press •

AMERICAN MEDICAL PRACTICE IN THE PERSPECTIVES OF A CENTURY—Bernhard J. Stern—*Commonwealth Fund,* 156 p., $1.50.

AMERICA'S NAVY IN WORLD WAR II—Gilbert Cant—*Infantry Journal,* 378 p., paper, illus., 25c. (This edition available to the members of the Armed Services only).

AMPHIBIANS AND REPTILES OF THE CHICAGO AREA—Clifford H. Pope—*Chicago Natural Hist. Museum,* 275 p., paper, illus., $1.75.

ANIMALS OF THE PACIFIC WORLD, Including Whales, Seals and Dugongs of Neighboring Waters—T. Donald Carter and Others—*Infantry Journal,* 195 p., paper, illus., 25c. (This edition available to the members of the Armed Services only).

ECONOMIC PROBLEMS OF LATIN AMERICA—Seymour E. Harris—*McGraw,* 465 p., illus., $4.

THE EMBRYOLOGY OF BEHAVIOR, the Beginnings of the Human Mind—Arnold Gesell—*Harper,* 289 p., illus., $5.

EPILEPSY—THE GHOST IS OUT OF THE CLOSET—Herbert Yahraes—*Public Affairs Comm.,* 31 p., paper, illus., 10c. (Pubic Affairs Pam., no. 98.)

THE HOSPITAL HEAD NURSE, Junior Executive and Clinical Instructor—Mary Marvin Wayland and others—*Macmillan,* 574 p., $3.50, 2nd ed.

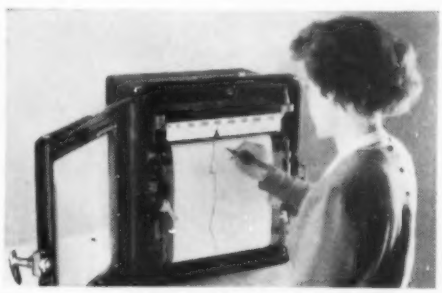
NAUTICAL MATHEMATICS AND MARINE NAVIGATION—S. A. Walling and others—*Macmillan,* 221 p., illus., $2.75.

THE SCIENCE OF MAN IN THE WORLD CRISIS—Ralph Linton, ed.—*Columbia Univ. Press,* 532 p., $4.

Science News Letter, December 30, 1944

ERRATA, Vol. 46, Nos. 1-27, July-December, 1944

PAGE	TITLE BEGINS	CORRECTIONS
5	Vaccination	Par. 4, lines 16-17, the research division of the Navy's Bureau of Medicine and Surgery *for* Capt. Krueger's group.
12	Muscle Weakness	Par. 4, line 6, muscles *for* patient's veins; the *for* his; line 7, the patient *for* him.
37	Light, Soft Asbestos	Par. 2, line 1, diffraction *for* defraction.
85	Caption	Line 4, 1/1000 *for* 1/000.
92	U. S. Authorities	Lines 7-10, *to read,* Lethanes because of their chemical relation to cyanides which are poisonous.
99	Artificial Fertilization	Col. 2, *delete* line 5, *and substitute:* microscopic scrutiny. The serum was at.
155	Serious Shortages	Line 3, Orford *for* Oxford.
196	Ducks Have Malaria	Par. 1, last line, hindbrain *for* forebrain.
228	Oxygen Lack	Last par., line 2, it is still 21% oxygen *for* it still has 21 parts of oxygen.
280	Potatoes Converted	Par. 1, last line, *after* glucose, *add* and *maltose.*
281	Crown Gall	*Delete* last paragraph.
325	Camera Aids	Last par., lines 2-3, geometric analyzer *for* analyzing projector.
344	Six Awards	Last par., Award was presented to the National Academy by Maj. Gen. G. M. Barnes.
403	Ex-Nova	Line 3, Dr. Walter Baade for Dr. Rudolph Minkowski.



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New Machines and Gadgets

⚙ *TWO-SEATER bicycle is made from an ordinary bicycle by the addition of a detachable low seat over the rear wheel. Two extensions to the pedals to hold the feet of the extra rider permit him to help propel the vehicle.*

Science News Letter, December 30, 1944

⚙ *ILLUMINATED socket wrench, of the familiar tire-removal type, has a tiny electric bulb set in the rear of each socket to light the nut when used in the dark. Flashlight battery, enclosed within an arm of the tool, furnishes the current which is controlled by switches in the center hub of the four-armed wrench.*

Science News Letter, December 30, 1944

⚙ *AERIAL survey camera, hand-held when used from the cockpit of any plane, has a screen marked off in grids representing the prospective view through the lens of the terrain being photographed. The grid lines converge to a vanishing point in the true horizon, and a fixed horizontal position is obtained by a hair-line sight.*

Science News Letter, December 30, 1944

⚙ *COMPACT heater on the ground under an airplane warms the engine so that it starts easily even in the coldest weather. The manually operated heater uses aviation fuel and, as shown in the picture, delivers hot air through a hose*

into a cover which completely encases the engine.

Science News Letter, December 30, 1944

⚙ *MIDGET microprojector, a new apparatus developed from earlier forms, is a device for counting and measuring the size of dust particles in mines and other places by projecting their magnified images on a screen. A tungsten-arc lamp used with it for illumination radiates a steady light.*

Science News Letter, December 30, 1944

⚙ *CYLINDERS of methyl bromide electrically operated, and supplementar cylinders operated pneumatically, const tute the principal features of a fire-extin guishing apparatus for airplanes. Pipe lines deliver the gas where needed an the light-weight system is easily installed*

Science News Letter, December 30, 19

⚙ *COAT STEAMING and drying ap paratus is a bodyshaped form adjus able to fit various sized coats and jacket When a coat is put in place on the form steam or hot air is forced outwardly un der pressure through the fabric of the ga ment to bring out the nap, dry it, an otherwise improve its appearance.*

Science News Letter, December 30, 19

If you want more information on the ne things described here, send a three-cent stam to SCIENCE NEWS LETTER, *1719 N St., N. W Washington 6, D. C., and ask for Gadget Bullet 239.*

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Where published sources are used they are cited.

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